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Satellite photo of Soviet carrier under construction.

How U.S. Collects Soviet Secrets

While the Kremlin relies heavily on classical espionage to learn American secrets, the U.S. depends more than ever on high-tech eavesdropping to penetrate the Soviet Union's closed society.

Such marvels as long-range microphones that can "hear" conversations in a room from the vibrations of a windowpane are among methods used to monitor Soviet activities.

By far the most valuable source of intelligence is American spy satellites. Sophisticated photoreconnaissance spacecraft flying 100 miles above the globe can detect objects on earth as small as a shoe box and can pinpoint the difference between soldiers in uniform and civilians.

Used to snoop on military compounds, dockyards and other high-priority sites, these satellites can provide high-resolution photographs of crates being loaded onto ships or workers digging new nuclear-missile silos. They also help the West keep track of the location and number of mobile SS-20 nuclear missiles targeted on Western Europe and Japan.

Surveillance satellites can tell real plants from camouflage nets that hide Soviet construction sites and can peer through clouds or darkness.

Supersnoops. Of growing importance to Western intelligence analysts are "ferret" satellites, which intercept a wide range of electronic signals, such as telephone calls, military-radio traffic and radar waves. "The air is just full of electronic signals today. A lot of it is very useful," says Ray Cline, an analyst at the Georgetown University Center for Strategic and International Studies.

The value of electronic intelligence satellites was demonstrated dramatically some years ago when conversations by Soviet President Leonid Brezhnev over his automobile telephone were picked up from

outer space. "I can assure you there was great value in that discovery. It's amazing what they talked about," says a U.S. intelligence expert.

Ferrets also are used to monitor signals from Soviet rocket tests, such as those emanating from the re-entry area of the missile firing range on Kamchatka Peninsula. The ability to intercept such signals is crucial to verifying arms-control accords.

Circle of eyes. To augment spacecraft, the Air Force has a fleet of planes crammed with electronic gear that serve as airborne listening posts on flights along U.S.S.R. borders. Ships off Soviet coasts conduct the same mission, as do ground-based monitors in Norway, China and other points around the Soviet perimeter.

Many U.S. intelligence-gathering aircraft are based in the Aleutian Islands and fly regularly along the Pacific Coast outside Soviet territory to watch submarine bases and other naval installations in the Far East.

One reason cited by the Soviets for shooting down Korean Air Lines Flight 007 in 1983 was the mistaken belief that it was a U.S. Air Force RC-135 reconnaissance plane that had violated Soviet airspace. Earlier the same night, an American RC-135 had approached the Soviet coast to monitor an anticipated missile test.

Cloak-and-dagger spying by human agents still plays a key role in U.S. intelligence gathering, particularly in recruiting ideological defectors from within the Soviet system. But the sheer volume of information gained via exotic technology has made it indispensable.

"Today, you get all that you can through technical means," says a former U.S. intelligence official. "Then, you simply fill in the gaps with the classical kinds of espionage."

By ROBERT A. KITTLE